

REMARKS

The present amendments and remarks are in response to the Office Action of April 20, 2006. Claims 36-39, 41, 43, and 45-47 were pending in the present application. Claim 41 has been canceled and its subject matter incorporated into claim 36. Claims 1-35, 40, 42, 44, and 48-65 were withdrawn subject to restriction/election requirements. Reconsideration of the application is respectfully requested in view of the following responsive remarks.

In the Office Action of April 20, 2006, the following actions were taken:

- (1) Claims 36-39, 41, 43, 45 and 46 were rejected under 35 U.S.C. 102(a) as being anticipated by U.S. Patent Application No. 2002/0198287 to Ohta et al. (hereinafter "Ohta");
- (2) Claims 36-39, 41, 43, 45 and 4 were rejected under 35 U.S.C. 103(a) as being unpatentable over Ohta;
- (3) Claims 36-39 and 43 were rejected under 35 U.S.C 102(b) as being anticipated by JP 62283174 to Handa et al (hereinafter "Handa");
- (4) Claims 36-39 and 43 were rejected under 35 U.S.C. 103(a) as being unpatentable over Handa;
- (5) Claims 36-39 and 43 were rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Pat. No. 5,981,651 to Patel et al. (hereinafter "Patel");
- (6) Claims 36-39 and 43 were rejected under 35 U.S.C. 103(a) as being unpatentable over Patel;
- (7) Claims 36-39, 43, and 47 were rejected under 35 U.S.C 102(b) as being anticipated by EP 1108758 to Johnson et al (hereinafter "Johnson");
- (8) Claims 36-39, 43, and 47 were rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson;
- (9) Claims 36-39, 41, 43, and 45-47 were rejected under 35 U.S.C 102(b) as being anticipated by EP 869 160 to Nichols et al. (hereinafter "Nichols"); and

(10) Claims 36-39, 41, 43, and 45-47 were rejected under 35 U.S.C 103(a) as being unpatentable in view of Nichols.

It is respectfully requested that the presently pending claims be reconsidered and allowed. Applicant submits that each and every amendment herein, and throughout the prosecution of the present application, is fully supported by the specification as originally filed, and that no new matter has been added.

The Examiner has again upheld rejections of claims 36-39, 41, 43, and 45-47 under 35 U.S.C. 102 and 35 U.S.C. 103 over five individual references. The Examiner has asserted that each of the references teaches the same product taught in the product-by-process claim of claim 36. The Applicant respectfully reiterates that Applicant acknowledges that patentability in product by process claims is based on the end product itself. The Applicant also recognizes that patentability of claims in such cases is not based on the method of production and that the method does not contribute to patentability except to differentiate the presently claimed compositions from those in the cited references

As stated in the previous office action response, the Applicant reasserts that the products taught in each of the cited references cannot be and are not the same as the claimed composition by virtue of the fact that the presently claimed process in fact yields different products than those disclosed in the cited references. It is this aspect of the present invention which the Examiner does not seem to understand. As such, the Applicants have augmented and reiterated the previously presented arguments in an attempt to aid the Examiner's understanding and in preparation for appeal. Because the recited process inherently yields a unique product, discussion of the process for reaching the desired product is useful and even essential in comparing the Applicant's invention to the references cited by the Examiner. As the Examiner continues to cite five references under both 35 U.S.C. §§ 102 and/or 103, the rejections will be discussed based on each individual reference rather than by the nature of the rejection.

Claim 36 of the present invention teaches a latex-containing ink-jet ink, which includes a liquid vehicle, a colorant that is dissolved or dispersed in the vehicle, and latex particulates that are dispersed in the liquid vehicle. Once again, the Applicant recognizes that, in the case of product by process claims, the product is being claimed, not the process. That being said, the process recited in claim 36 creates inherently distinctive latex particulates. The latex particulates are formed by a specific process, which requires the preparation of a monomer emulsion that includes an aqueous phase and an organic monomer (dispersed or co-dispersed in the aqueous phase) including at least one blocked acid monomer. In other words, the polymerization (or copolymerization) of the blocked acid monomer occurs within the discontinuous phase of the aqueous emulsion. After polymerization of the organic monomer(s), which includes at least one blocked acid monomer, blocked acid latex particulates dispersed within the aqueous phase are formed. The blocked acid latex particulates are then unblocked to form acidified latex particulates that are suspended in the aqueous phase, and the aqueous phase forms at least part of the liquid vehicle of the ink-jet ink. Additionally, the process of unblocking the blocked acid latex particulates necessarily releases blocking groups. The presently pending claim 36 has been presently amended so as to include the limitation that the blocked acid monomer includes a blocked strong acid group selected from the group consisting of blocked phosphonic acid, blocked phosphinic acid, blocked pyrophosphoric acid, blocked boronic acid, blocked sulfonic acid, blocked sulfinic acid, blocked phosphorous acid, blocked hydroxamic acid, and blocked cyanuric acid.

In response to the Applicant's previous arguments, the Examiner stated that "the aqueous phase of the latex need not be part of the claimed product." The Examiner is invited to review page 20, lines 16-29 of the specification of the pending application. For the Examiner's convenience these lines are set forth as follows:

A typical liquid vehicle formulation that can be used with the latexes described herein can include water, and optionally, one or more co-solvents present in total at from 0 wt% to 30 wt%, depending on the

ink-jet architecture. Further, one or more non-ionic, cationic, anionic, or amphoteric surfactant(s) can be present, ranging from 0 wt% to 5.0 wt%. The balance of the formulation can be purified water, or other vehicle components known in the art, such as biocides, viscosity modifiers, materials for pH adjustment, sequestering agents, preservatives, and the like. Typically, the ink vehicle is predominantly water.

It is to be noted that the latex dispersions of the present invention inherently include a predominantly aqueous phase (or liquid phase) that can include water and other components, such as surfactants, solvents, etc. Thus, the liquid phase of the latex dispersion can be admixed with liquid vehicle components to form the liquid vehicle, or the liquid phase can become the liquid vehicle upon addition of colorants. (emphasis added)

As defined in the specification, the liquid phase includes the aqueous phase in which the blocked acid monomers are polymerized and subsequently unblocked. Hence, although not expressly claimed, the blocking groups are definitionally present or pass to the liquid phase of the composition.

Rejections over Ohta

The Examiner upheld rejections on claims 36-39, 41, 43, 45, and 46 under 35 U.S.C. 102 and 103 as being either anticipated by or unpatentable over Ohta. The Examiner has asserted that Ohta teaches a latex containing ink-jet ink comprising an aqueous liquid vehicle, a pigment colorant dissolved or dispersed in the liquid vehicle, and a dispersed surface sulfonated acidic emulsion latex. At first glance, Ohta appears to teach a similar ink to the ink claimed in claim 36, however, the ink **composition is different** from that of the pending claims, which difference arises because of the process or method of manufacture of the latex particles. Once again the Examiner is reminded that although the process described below does not impart patentability per se, it is the process which gives the composition patentability because the latexes produced by the process are distinct from those in the cited references.

Ohta teaches two ways to manufacture the sulfonated latex particles used in its ink. First, the sulfonated dispersibility-imparting group can be part of the monomer structure of the constituent resin and then polymerized. Second, the a base polymer or skeletal backbone of styrene-(meth)acrylic acid is made without the sulfur containing dispersibility-group. Then, the already polymerized styrene copolymer can be altered so that and the dispersibility-imparting group is grafted to the skeletal backbone of the styrene copolymer. In other words, the monomers are polymerized together first and then a sulfur containing group is grafted thereto. See Paragraph 59 of the Ohta specification. Such a method of polymerizing is clearly different from the process described in the present claims and inherently results in polymers which may have similar characteristics, but which are structurally different. A grafted polymer is not the same as a copolymerized polymer, as is known to those skilled in the art.

In other embodiments of the prior art, as is generally known in the art, latex particulates are often formed through emulsion polymerization of an acid monomer, with or without other monomers, thus creating particulate surface charge. The acid monomers should be sufficiently hydrophobic so as to substantially remain in the organic phase of the emulsion that forms the particles. The need for hydrophobicity has limited effective polymer design to the use of relatively weak organic acids. Thus, monomers including strong acids (such as sulfonates, phosphonates, etc.), or monomers including multiple acids (such as di-acids), are excessively water soluble for use in typical emulsion polymerization processes. Strong acid monomers and multiple acid monomers tend to migrate out of the organic phase and into the water phase where they form water-soluble and ion-bearing polymers that are detrimental to the ink. The resultant increase in the ionic strength of the aqueous phase of the latex dispersion reduces the effect of the charge surrounding each particle, thus weakening particle dispersion stability (the original goal in incorporating surface charge). This is why the process of manufacturing the latex is so important, and why the process of manufacture affects the final compositional properties.

As described above, the sulfur containing polymer latex used in Ohta can be manufactured in two ways, namely, grafting and copolymerization. Grafting has been discussed above and compositionally distinguished. Regarding the copolymerization of monomers, the monomers are polymerized together using emulsion polymerization to yield a copolymer having sulfur-containing groups, at least on the surface. As mentioned also previously, this type of polymerization is problematic in that the strong acids or sulfur containing monomers have the tendency to migrate out of the organic phase and into the water phase prior to polymerization because of their high solubility. This results in a latex solution that has high concentrations of sulfur containing monomers in the aqueous phase thereby weakening the desired effect of stable particle dispersion. Conversely, the Applicant's method would prevent such migration by using blocking. It is worth noting that it is this exact type of migration problem that the claimed composition (defined by the method of making) was intended to overcome.

The process of manufacturing the latex particles used in the ink of claim 36 is distinct from both of the processes taught in Ohta and, as discussed, it yields a unique latex ink composition. As a desired effect of the present application is better dispersibility, any element of the ink composition that affects the particle dispersion of the latex ink should be noted. In the case of one of Ohta's processes, there are strong acids and/or sulfur-containing monomers that have a tendency to migrate out into the aqueous phase, thus adversely affecting the dispersibility. For Ohta's other method, residual dispersibility-imparting groups remain in the solution and grafted polymers vs. copolymerized monomeric process are structurally very different.

In addition to these important differences, not only does the ink composition of claim 36 not have large amounts of unpolymerized sulfur monomers or unattached sulfur containing dispersibility groups present during formation (which preserves the greater ionic difference between the latex particles and the aqueous phase), but the ink composition has amounts of the blocking member which is released into the aqueous phase, which are freed after the blocked acid groups are unblocked and become released into the aqueous phase. None of these compositional properties are present in Ohta.

Therefore, as the ink composition of claim 36 is distinct over those taught in Ohta, it is respectfully requested that all rejections with respect to this reference be withdrawn.

Rejections over Handa, Patel, and Johnson

As originally filed claim 41 was not rejected over Handa, Patel, or Johnson, these rejections are rendered moot in view of the amendment of claim 36, which includes the limitations of claim 41. Withdrawal of these rejections is requested

Rejections over Nichols

The Examiner upheld rejections to claims 36-39 41, 43, and 45-47 under 35 U.S.C. 102 and 103 as being either anticipated by or unpatentable over Nichols. Nichols teaches an ink composition including an ink vehicle and a resin emulsion of resin particles and a pigment colorant. The resin emulsion is an emulsion polymerized resin of monomers having carboxylic acid groups. Once again, there is no teaching of blocking the acid group prior to polymerization and unblocking the acid group after polymerization. Therefore, the ink composition does not contain released blocking groups. As the product of the current invention is made in this manner, it yields an effectively distinct and unique ink composition for the reasons laid out above. As such, it is respectfully requested that all rejections based on this reference be withdrawn and all the claims be allowed.

CONCLUSION

In view of the foregoing, Applicant believes that claims 36-39, 43, and 45-47 present allowable subject matter and allowance is respectfully requested. It is also submitted that at least claim 40 be rejoined upon allowance of claim 36.

If any impediment to the allowance of these claims remains after consideration of the above remarks, and such impediment could be removed during a telephone interview, the Examiner is invited to telephone W. Bradley Haymond (Registration No. 35,186) at (541) 715-0159 so that such issues may be resolved as expeditiously as possible.

Please charge any additional fees except for Issue Fee or credit any overpayment to Deposit Account No. 08-2025

Dated this the 20th day of July, 2006.

Respectfully submitted,



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